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Mathematical methods in some diffraction problems for domains with defects

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Abstract

© 2002 IEEE. Mathematical methods in diffraction problems for elastic time-harmonic waves on defects are considered. It is assumed that body forces are absent and the defect may be disposed on the plane in the homogeneous isotropic space or on the media interface of two homogeneous isotropic half-spaces. Systems of singular integral equations are obtained for the problems. Some approaches to elastodynamic problems in the case of an anisotropic elastic medium are considered too. Analogues of the Lopatinskii condition and boundary conditions of an elliptic boundary value problem in the halfspace are obtained. It is shown that both approaches are equivalent. To solve these problems classes of outgoing from plane solutions are introduced. The Fourier transformation in the class of generalized functions of slow growth at infinity and presentations of solutions of the problems by potential functions are used.

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Keywords

Anisotropic magnetoresistance, Boundary conditions, Boundary value problems, Diffraction, Elastodynamics, Fourier transforms, Integral equations, Laplace equations, Mathematics, Stress